JOBS F-102 & F-103

MEDOMAK RIVER HABITAT AND FISHERY INVESTIGATIONS

INTERIM SUMMARY REPORT NO. 1 (1997)

INTRODUCTION

From its source in Liberty to tidewater in Waldoboro, the Medomak River contains habitat for a wide variety of fish species, including stocked brown trout. Fisheries biologists from the Me. Department of Inland and Wildlife have recently quantified the habitat and fish populations of this river, and have monitored its water quality parameters at several sites.

OBJECTIVE

The primary objective of this study was to quantify the physical habitat of the Medomak River, with a secondary objective of collecting detailed data on water quality and fish populations throughout the watershed.

METHODS

Methods used were from the Fishery Division's 1989 Guidelines For Quantifying Physical Habitat, as modified from U.S. Fish and Wildlife Service's Habitat Evaluation Procedures. During July and August 1994, physical measurements of river width and depth were measured at selected transects. Depths were measured at three equidistant locations along a transect line established perpendicular to water flow. Width measurements were taken for both the wetted channel and from bank to bank for determination of width during full-river conditions. Substrate type, bank stability, riparian habitat, and percent shade, were categorized at each transect. Gradient was measured between transects and information was recorded regarding the size and water temperature of each tributary. Water temperatures were taken daily during the 1994 habitat survey, and additional water quality data were collected for dissolved oxygen content, pH, alkalinity, and conductivity during each site visit for electrofishing or gillnetting in 1990 and 1994-1996.

RESULTS

The Medomak River was divided into 3 sections of nearly equal length, according to habitat types. The river is 31 miles long and contains an estimated 181 acres. Based on changes in flow, substrate, and depth characteristics, the boundaries of the 3 sections of river were assigned as (1) the North Union Road, (2) State Route 220, (3) the head of tide. In the upper section above the North Union Road, 72% of the river's flow was rated as riffle or run, averaging less than 1 foot in depth. Substrate was gravel and rubble in 49% of this section. In the middle section, 79% of the river was rated deadwater, averaging slightly less than 3 feet in depth. Substrate was silt, muck, clay, sand, or ledge in 81% of this section. In lower section had 69% of the river flow was rated deadwater with a mean depth of more than 3 feet. Substrate was rated gravel and rubble in 61% of this section. Tables 1 & 2 summarize stream, flow, and substrate characteristics.

Because a deficiency was noted for a 1990 dissolved oxygen concentration measurement in a 22' deep pool near Orff's Corner several additional water quality measurements have been made in recent years at various sites. Results are summarized in Table 3.

Historical records and fishery sampling by gill netting and electrofishing have demonstrated the presence of both brook trout and brown trout, either from stocking or natural reproduction. Stocking history and fish collection results are summarized in Tables 4 & 5.

RECOMMENDATIONS

Based on our studies of the fish habitat, water quality, and fish populations, brown trout stocking sites were modified to increase survival and improve returns to the anglers. Annual stockings of 1000 spring yearling brown trout are recommended for the upper section, to be stocked at sites upstream of the North Union Road bridge where survival to older ages has been documented. During instances of surplus production in our hatcheries stockings of unscheduled brown trout may benefit the lower river. Because lack of cool water during the summer months limits wild brook trout survival, only low numbers of brook trout are expected to be caught.

Submitted by: William L. Woodward Fishery Biologist Region B

Section		Dimension	(feet)			Area	(feet ²)
	Length	Width	Average Depth		Riffle	Run	Deadwate r
Source to North Union Road	48,000	24	1.0		217,600 (16%)	782,000 (56%)	385,000 (28%)
				Average Depth	0.5	1.0	1.5
North Union Road to Route 220	56,200	40	2.5		125,900 (5%)	371,400 (16%)	1,801,600 (79%)
				Average Depth	1.4	1.9	2.7
Route 220 to Tidewater	51,600	80	3.0		596,100 (14%)	701,200 (17%)	2,885,000 (69%)
				Average Depth	1.0	1.4	3.5

TABLE 2. Substrate Characterization (Square Feet).

Section	Gravel	Rubble	Boulder or	Gravel and	Sand	Silt, Muck,
(Acreage)			Ledge	Rubble		or Clay
Source to	337,800	130,400	235,400	238,600	19,200	476,000
North <u>(32)</u>						
Union						
Road						
North <u>(53)</u>	142,200	16,800	119,800	47,400	302,700	1,736,200
Union to						
Route 220						
Route 220	349,000	1,376,400	747,600	848,000	27,800	819,500
to <u>(96)</u>						
Tidewater						
Acreage	19	35	25	26	8	70

Table 3. Water Quality Observations, Medomak River, 1990 & 1994.

Date	Site	Depth	Dissolved	Temp.°	pН	Total
			Oxygen Content	C.		Alkalinity
8/10/90	Near Orffs	Surface	6.9ppm	24.0	6.4	10.0
		6.5 meters	1.0	15.5	6.5	49.0
	Below Ellard Road	Surface	6.2	24.0	6.5	11.0
		3.25 meters	0.3	13.5	6.2	101.0
8/23/94	Below Rt.	Surface	5.8	20.0	6.2	10.0
		3.6 meters	0.7	16.0	-	-
	Near Hope Brook	Surface	6.2	17.0	6.2	12.0
		3 meters	6.4	17.0	-	-
8/24/94	Behind VFW	Surface	8.4	18.0	6.4	10.0
	Winslows M.	"	8.7	19.5	6.5	10.0
	Wagner Brdg	"	8.5	20.0	6.4	9.0
8/25/94	Below Rt. 17	"	8.4	17.0	6.4	20.0
	Skidmore Rd	"	9.0	19.0	6.2	10.0
	N. Union Rd.	"	9.0	18.0	6.3	10.0
	Hatchery Bk.	"	-	19.0	6.5	3.0
	Fishtown Rd.	"	-	16.0	6.2	2.0
	Palermo Rd.	"	9.0	15.0	5.4	10.0
8/26/94	Below Wagner Brdg	66	8.9	19.0	6.2	4.0
	N. Union Rd.	44	10.0	19.5	6.3	3.0

 Table 4. Stocking History of Brown Trout, Medomak River , Since 1985.

Date	Number	Size	Number per #	Age	Hatchery
Springs	1,000	6-8 inches	2.5-4.2	I+	New Gloucs.
1985-1987					& Palermo
Spring 1987	1,585	8-10 inches	4.2	I+	Palermo
Spring 1988	1,000	6-8 inches	7.7	I+	"
Spring 1988	40	16-18 inches	0.2	VII+	New Gloucs.
Spring 1989	1,000	6-8 inches	7.3	I+	Palermo
Spring 1989	25,000	1.5- 2 inches	417	0	New Gloucs.
Springs	1,000	6-10 inches	3.7-7.0	I+	Palermo
1990- 1995					
Spring 1995	27,738	1.5- 3 inches	134	0	New Gloucs.
Spring 1996	1,000	6-8 inches	4.0	I+	Palermo

Table 5. Fish Collection Results, Medomak River, since 1990.

Site	Date	Salmonid Captures	Num- bers & Size	Non-salmonid Captures	Density & Ages	Comments
Winslows Mills	7/31/90	none	-	EEL,WHS	common juv.& adults	E.F.,100 feet 26.5° C
Ellard Rd.	٤٤	none	1	EEL		E.F., 50 feet, 26.0°C
Near Orffs Corner	8/2/90	none	-	WHS	common adults	G.N. depth- 22 feet
Fishtown Road bridge	8/16/90	none	1	EEL,WHS, BND	common juv.& adults	E.F.,250 feet 20.0°C
near mouth of Hatchery Brook	8/16/90	BKT	2-8&12 inches	CMS,BND, CCB	common juv.& adults	E.F.,150 feet 21.0°C
Washington Road(Rt.220)	8/23/94	none	1	11-PKL,1-WHS 13-LMB,8-YLP 3-PKS,33-SRA 23-GLS,2-EEL	common all repre- sented	E-Boat,½ mi. downsteam , 20.0°C
Medomak P. to Hope Bk.	٠.	none	-	7-PKL,30-YLP 6-WHS, 9-PKS 2-WHP, 5LMB 82-GLS, 3-EEL 17-SRA, 1-CRA	common juv.& adults	E-Boat, 1 mi. upstream, 17.0°C
Behind VFW Waldoboro	8/24/94	BNT	1-11 inches	44-SMB,1-BND 31-EEL,1-WHS	common juv.& adults	E.F., 100 feet 18.0°C
Winslows Mills	دد	none	-	79-LMB,1-WHS 42-EEL	common yoy,juv. & adults	E.F., 100 feet 19.5°C
Wagner Bridge	66	none	-	12-SMB, 2-PKS 12-EEL	66	E.F., 80 feet 20.0°C
Storer Pd. Rd. Crossing	8/25/94	none	-	4-LMB, 2-SMB 1-WHS, 1-GLS 1-PKS, 1-YLP 1CMS, 23-EEL	rare to common yoy,juv. &adults	E.F., 150 feet 17.5°C
Skidmore Road		none	-	14-WHS,6-CMS 13-BND,1-NSK 18-MIN,16-EEL	rare to common juv.& adults	E.F., 150 feet 19.0°C

TABLE 5. (continued)

N. Union Rd. Salmonid Captures bers & Size Captures bers & Size Captures & Ages	<u> </u>			i	<u> </u>	ı	İ
N. Union Rd. Size	Site	Date					Comments
N. Union Rd. 8/25/94 none			Captures		Captures	& Ages	
December 19-CMS,7-BND 14-EEL 18-0°C 14-EEL 18-0°C 267-CCB,1-GLS 16-ET 19-0°C 18-BKT 20-2 to6 1-BND 19-CMS,7-BND 19-CMS,7-MS 19-CMS,7-BND 19-C				Size			
Name	N. Union Rd.	8/25/94	none	-	l '		
BKT					, '	juv.&	feet 18.0°C
Section Sect					14-EEL	adults	
Brook Brook BKT 20-2 to6 1-BND rare E.F., 200 feet 14.0°C	near mouth	44	BKT	8-2 to 12	67-CCB,1-GLS	common	E.F., 110
BKT 20-2 to6 inches 2-CRA in CCB&BN D	of Hatchery			inches	50-CMS,32-WHS	yoy,juv.	feet 19.0°C
BKT 20-2 to6 inches 24-BND, 2-WHS feet 14.0°C	Brook				74-BND,3-NSK	&adults	blackspot
BKT 20-2 to6 inches rare E.F., 200 feet 14.0°C					2-CRA		in
in Hatchery Brook "BKT 20-2 to6 inches 1-BND rare juv. common feet 14.0°C E.F., 200 feet 14.0°C Fishtown Road "none - 24-BND, 2-WHS 11-CCB, 16-EEL common juv. & feet 16.0°C E.F., 85 feet 16.0°C Palermo Road "none - 12-WHS, 5-BND 20-CCB, 2-EEL & adults E.F., 100 feet 15.0°C Wagner Bridge 8/26/94 none - 24-SMB, 11-PKL 20-CMB, 1000 feet 19.0°C Common 20-CMB, 2-EEL E.Boat, 1000 feet 24-SMB, 11-PKL 20-CMB, 1000 feet 20-CCB, 2-EEL Common 20-CMB, 2-EMB, 11-PKL 20-CMB, 1000 feet 20-CMB, 2-CMB, 1000 feet 20-CMB, 2-CMB, 2-CMB, 1000 feet 20-CMB, 2-CMB, 2-CMB, 1000 feet 20-CMB, 2-CMB,							CCB&BN
BRT 20-2 too inches inches juv. feet 14.0°C Fishtown Road Road Fishtown Road Road							D
Fishtown Road Road Fishtown Road Road Fishtown Road R	in Hatchery	"	BKT	20-2 to6	1-BND	rare	E.F., 200
Road	Brook			inches		juv.	feet 14.0°C
Palermo	Fishtown	"	none	-	24-BND, 2-WHS	common	E.F., 85
Palermo "none - 12-WHS, 5-BND 20-CCB, 2-EEL rare-juv. & adults feet 15.0°C E.F., 100 & adults feet 15.0°C Wagner 8/26/94 none - 24-SMB, 11-PKL 12-PKS, 1-BUL 1-GLS, 30-EEL 24-SMB, 11-PKL 20-PKS, 1-BUL 1-GLS, 30-EEL 24-SMB, 11-PKL 20-PKS, 1-BUL 12-PKS, 1-BUL 12-PKS, 1-BUL 22-BND, 2-WHS 24-SMB, 2	Road				11-CCB, 16-EEL	juv. &	feet 16.0°C
Road						adults	
Wagner 8/26/94 none - 24-SMB, 11-PKL 12-PKS, 1-BUL 19.0°C common yoy, juv. 1000 feet 29.0°C ½ mile above N.Union Rd. "BNT 1- 11 11 inches 10.0°C 12-PKS, 1-BUL 19.0°C 22-BND, 2-WHS 20.00 common 20.00 E.F., 100 20.00 N.Union Rd. Skidmore Road 8/25/95 BNT 1- 4 20.00 SMB,CMS, BND, 20.00 common 20.00 E.F., 300 20.00 N. Union Rd. BNT 5-8 to 10 20.00 "E.F., 400 20.00 feet 19.0°C E.F., 400 20.00 feet 19.0°C, blks 20.00 ½ mile above N.Union Rd "BNT 4-9 to 10 20.00 "E.F., 300 20.00 Feet 18.0°C downstream "BNT 3-8 to 9 CMS, BND, EEL, "E.F., 500 E.F., 500	Palermo	"	none	-	12-WHS, 5-BND	rare-juv.	E.F., 100
Bridge 12-PKS, 1-BUL 1-GLS, 30-EEL yoy, juv. & adults 1000 feet 19.0°C ½ mile above N.Union Rd. BNT 1- 11 inches 22-BND, 2-WHS 5-CCB, 3-CMS 1-MIN, 13-EEL juv. & feet 19.5°C adults Skidmore Road 8/25/95 BNT 1- 4 inches inches SMB,CMS, BND, EEL,WHS common all ages feet 19.0°C N. Union Rd. BNT 5-8 to10 inches inches " E.F., 400 feet 19.0°C, blks pt ½ mile above N.Union Rd BNT 4-9 to10 inches " E.F., 300 feet 18.0°C downstream BNT 3-8 to 9 CMS, BND, EEL, " E.F., 500	Road				20-CCB, 2-EEL	& adults	feet 15.0°C
Bridge	Wagner	8/26/94	none	-	24-SMB, 11-PKL	common	E-Boat,
1-GLS, 30-EEL	Bridge				12-PKS, 1-BUL	yoy,juv.	1000 feet
N.Union Rd. N.Union Rd. N.Union Rd. Skidmore Road N. Union Rd. Skidmore Road N. Union Rd. BNT Skidmore Road N. Union Rd. BNT Skidmore Road N. Union Rd. BNT Shidmore Road SMB,CMS, BND, common all ages feet 19.0°C E.F., 300 Feet 19.0°C E.F., 400 Feet 19.0°C E.F., 300 Feet 19.0°C Feet 19.0°C Feet 19.0°C E.F., 300 Feet 19.0°C Feet 19.0°C Feet 19.0°C E.F., 300 Feet 19.0°C Ü				1-GLS, 30-EEL		19.0°C	
Skidmore 8/25/95 BNT 1- 4 inches SMB,CMS, BND, EEL,WHS common all ages E.F., 300 feet 19.0°C N. Union Rd. "BNT 5-8 to10 inches "EEL,WHS "E.F.,400 feet 19.0°C,blks pt 1/4 mile above "BNT 4-9 to10 inches "E.F.,300 feet 18.0°C N.Union Rd "BNT 3-8 to 9 CMS, BND,EEL, "E.F., 500	1/4 mile above	66	BNT	1- 11	22-BND, 2-WHS	common	E.F., 100
Skidmore 8/25/95 BNT 1- 4 inches SMB,CMS, BND, EEL,WHS common all ages E.F., 300 feet 19.0°C N. Union Rd. "BNT 5-8 to10 inches "EEL,WHS "E.F.,400 feet 19.0°C,blks pt 1/4 mile above "BNT 4-9 to10 inches "E.F.,300 feet 18.0°C N.Union Rd "BNT 3-8 to 9 CMS, BND, EEL, "E.F., 500	N.Union Rd.			inches	5-CCB, 3-CMS 1-	juv. &	feet 19.5°C
Road inches EEL,WHS all ages feet 19.0°C N. Union Rd. "BNT 5-8 to10 inches "E.F.,400 feet 19.0°C,blks pt 1/4 mile above N.Union Rd downstream BNT 4-9 to10 inches "E.F.,300 feet 18.0°C DNT 3-8 to 9 CMS, BND,EEL, "E.F., 500					MIN, 13-EEL	adults	
N. Union Rd. "BNT 5-8 to10 "E.F.,400 feet 19.0°C,blks pt 1/4 mile above "BNT 4-9 to10 "E.F.,300 feet 18.0°C downstream "BNT 3-8 to 9 CMS, BND,EEL, "E.F., 500	Skidmore	8/25/95	BNT	1- 4	SMB,CMS, BND,	common	E.F., 300
N. Union Rd. "BNT 5-8 to 10 "E.F.,400 feet 19.0°C,blks pt 1/4 mile above N.Union Rd BNT 4-9 to 10 inches feet 18.0°C downstream "BNT 3-8 to 9 CMS, BND,EEL, "E.F., 500	Road			inches	EEL,WHS	all ages	feet 19.0°C
19.0°C,blks pt	N. Union Rd.	"	BNT	5-8 to10	٤6		E.F.,400
½ mile above "BNT 4-9 to10 inches "E.F.,300 feet 18.0°C N.Union Rd "BNT 3-8 to 9 CMS, BND,EEL, "E.F., 500				inches			feet
½ mile above "BNT 4-9 to10 inches "E.F.,300 feet 18.0°C N.Union Rd "BNT 3-8 to 9 CMS, BND,EEL, "E.F., 500							19.0°C,blks
½ mile above "BNT 4-9 to10 inches "E.F.,300 feet 18.0°C N.Union Rd "BNT 3-8 to 9 CMS, BND,EEL, "E.F., 500							pt
N.Union Rd inches feet 18.0°C downstream "BNT 3-8 to 9 CMS, BND,EEL, "E.F., 500	1/4 mile above	"	BNT	4-9 to10	٤6	"	
downstream "BNT 3-8 to 9 CMS, BND, EEL, "E.F., 500							
		44	BNT	3-8 to 9	CMS, BND,EEL.	"	E.F., 500
OTAL TOS	of Rt. 105			inches	WHS,GLS		feet
16.0°C,blks	-				ĺ		
pt							l
Skidmore 8/22/96 BNT 3-9 to12 LMB, CMS, BND " E.F., 300	Skidmore	8/22/96	BNT	3-9 to12	LMB, CMS,BND	"	
Road inches EEL feet 22.0°C			·		, ,		· ·
N.Union Rd. "BNT 1-9 YLP, PKS, CMS, "E.F.,400		"	BNT			44	
inches BND,EEL feet 22.0°C					, , , , ,		· /
1/4 mile above "BNT 4-4 to 10 CMS, BND, EEL, "E.F., 300	1/4 mile above	44	BNT		,	"	

N.Union Rd		BKT	inches	WHS		feet 20.0°C
			1- 7			
			inches			
downstream	"	BNT	3-9 to11	CMS, BND,EEL,	"	E.F.,400
of Rt. 105			inches	WHS, PKS		feet 22.0°C